Why do masses bend spacetime?

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Abstract

The energy-momentum tensor as "source term" of gravity is not something that could be objectified or grasped in the microscopic or macroscopic range. In this paper we present a mass-immanent modality by which masses are able to generate gravity and curved spacetime, namely the rapid oscillatory rotation of proton waves. Protons are contained in every mass and due to the rapid rotation of their rotational waves, as shown in a recent paper, like a centrifuge pull everything inside that is within range of their oversized quantized radius. In the case of a proton, this quantized radius is more than 19 powers of ten larger than its actual radius, so that mvr ≥ h/2 (Heisenberg-Millette uncertainty principle) is fulfilled.

It is not known why mass bends space-time. The General Theory of Relativity states that mass curves space-time and that gravitation is the result of the curved space-time. But it doesn't say why mass bends space-time. Indeed, the energy-momentum tensor as "source term" (1) of space-time curvature is not something that could be objectified or grasped in microscopic or macroscopic space. The famous rubber sheet (1), which is repeatedly used as an illustration, is also misleading, because it is not the mass that curves the rubber sheet, but the force of weight, and a second mass is necessary, namely that of the earth, which causes the gravity of the mass, that lies on the rubber blanket.

In any case, one has to assume that the cause of the space curvature must naturally be mass-immanent and that the cause should be sought in the nucleons inherent in all matter and their angular momentum.

The angular momentum of particles is the result of rotational waves, which are assumed not to rotate in a classical sense. One reason is that if you take the measured quantized angular momentum of e.g., electrons and divide it by mass m and radius r, you get a velocity faster than the speed of light, which can't be, so they don't rotate. Therefore, the rotational waves of protons or nucleons have never been ascribed a rotational wavelength, frequency or energy, but exclusively a spin (2,3), which is a quantized particle property and may not reflect true velocity or angular momentum as the product of a particle's radius and angular momentum. If the rotational velocity were quantized to $h/4\pi mr$ or oversized due to the quantized angular momentum, then the rotational energy would not be proportional to the mass of a particle but inversely proportional to it, which is not possible.

$$if\ v := \frac{h}{4\pi mr} \rightarrow\ E_{rot}\ =\ mv^2\ = \frac{mh^2}{16\pi^2 m^2 r^2} = \frac{h^2}{32\pi^2 mr^2} \qquad [1]$$

Therefore, the rotational wave of protons is very likely to have a velocity that has a different (smaller) value than that calculated from the spin. In addition, the rotational velocity cuts out from the formula of the spin, instead of the velocity, the (virtual) radius/range of the force of the proton is quantized and oversized (4). This could also be shown using data from CERN and the spike in the polarizability curve in electron scattering from protons in Nature, 2022 (5), in which the energy of the matter waves of the electrons interferes with the rotational wave of the protons at the same energy. A wave rotation frequency of 2072 Hz was found for protons (6), which is in the frequency range of centrifuges (7).

Because the proton wave rotates quickly, as calculated using data from CERN, it acts like centrifuges. The mass of a proton can be assumed as the sum of virtual mass points inside the proton rotating freely at a distance around the center of the proton. It is known that in a mass formation with freely moving substructures, which rotates rapidly as a whole, a specific mass distribution

$$\rho\ (\vec{r}) = \rho_i/(1 + \frac{r^2}{r_c^2}) \quad [2]$$

is generated under isothermal conditions. This mass distribution corresponds to a density gradient within the mass formation of m/r^2 (this is also roughly the density distribution in galaxies or in other rapidly rotating mass distributions).

In a rapidly rotating system such as protons or galaxies, we find a density distribution $d\delta/dr$ of $m/r^2 = \omega^2 r/ß$, a relation from density gradient centrifugation (7). The rotation of the proton can be compared to a density gradient centrifugation using a special centrifuge, in which the density gradient of the centrifugate is also constant. A rapidly rotating proton accelerates the virtual mass points inwards. Analogously to the centrifuge, the resulting density gradient within the proton is proportional to the centripetal acceleration. With the help of this formula, we were able to determine the proportionality factor between the centrifugal acceleration of a mass point at the edge of the proton and the density gradient:

$$\frac{d\delta}{dr} = \frac{m}{r^2} = \frac{\omega^2 r}{ß} \quad [3]$$

Hence, all mass-points are accelerated inward by fast rotation. In addition to their kinetic energy, the mass points also have potential energy because they rotate at a distance around the center of the proton. The potential energy of a mass point that has the distance from the center is calculated accordingly as $mgr\ (x)$ (g is the centripetal acceleration).

$$mgr\ (x) = m\frac{m\beta}{r(x)^2}\ r(x) = \frac{m^2\beta}{r(x)} \quad [4]$$

Due to the fact that mass points at the edge of the proton rotate faster than those circling closer to the center, there is a potential gradient from the outside to the inside, but this is strictly linear. Since the punctiform center itself does not rotate, the potential difference between inside and outside is

$$\emptyset\,(\vec{r}) = \int_{ri}^{r} g dr \quad [5]$$

which also results from the simple subtraction of the outer from the inner potential. Due to this potential difference, a gravitational energy arises in the proton, which multiplies the potential difference with the proton mass. This proton field is, however, limited, its field lines extend up to the quantized radius of the proton calculated from mvr=h/2, the Heisenberg-Millette uncertainty principle (8). The quantized radius r of a proton has the value $1.7 \cdot 10^4$ m, that of our Milky Way $1.6 \cdot 10^{23}$ m. This also shows that the gravitation is incomplete and that only neighboring galaxies like Andromeda are attracted by the Milky Way. The dependence on the distance is r^2. Since the field strength of the field is an acceleration towards the proton center, every particle and body with a mass > 0 is subjected to an attractive force, the field corresponding to a monopolar gravitational field.

Substituting the values for = 2072.18 Hz, r = $0.87 \cdot 10^{-15}$ m, m = $1.6726 \cdot 10^{-27}$ kg into the equation gives a value for the constant of proportionality of 6.76 m^3/kgs^2, which corresponds to the value of the gravitational constant with a deviation of only 6 thousandths.

$$ß = \frac{\omega^2 r^3}{m} = 6.76 * 10^{-11} \frac{m^3}{kgs^2} \quad [6]$$

The hypothesis can thus be verified. The field whose force vector points to the proton center is caused by the constant monopole moment of the exact magnitude of the proton mass.

Thus, this fixed relationship holds for all macroscopic masses and distances. But how can one explain the exact mechanism? Well, the answer is relatively simple. The reason why protons, like a centrifuge, not only attract mass points within the proton but also instantaneously masses far away, is due to the fact that the proton radius is quantized to an oversize of $1.7 \cdot 10^4$ m (h/2mv =h/4πfrm) and up to $1.6 \cdot 10^{23}$ m in the case of the Milky Way. Summing up, the small gravitational fields of the protons result in the gravitation of the individual large masses in the universe, except for the mass defect. The proton rotation is therefore very likely the cause of gravitation in this universe and the theory of relativity is only its effect on space-time, which also explains why the values in the theory of relativity (ART) are always correct.

Thus, the rapid rotation in the proton creates a gravitational field inside the proton due to the centripetal force. Mass is also attracted outside of the proton because of the oversized radius (because of Heisenberg's relation mvr must be greater than h/4π), which is about 10^4 m for the proton. The small proton gravitational fields add up to the gravitational field of large masses, due to the superposition principle (9) for conservative fields, except for the mass defect.

$$F = \sum_{i=1}^{n} \frac{m m_p G}{r^2} = \frac{m(M - \Delta M)G}{r^2} \quad [6]$$

A Franco-German research team recently showed that gravity is significantly influenced by the Earth's magnetic field (10). They used magnetic field measurements from the GFZ satellite CHAMP and extremely accurate measurements of the Earth's gravity field, which originate from the GRACE mission (11). This also supports the assumption of a gravitational field (as the sum of individual proton fields) that can be influenced, and not the idea of gravitation generated by space curvature, while this form of attraction assumes a constant gravitational acceleration and constant gravitational constant that cannot be influenced. Since the earth's magnetic field is in the range of the magnetic field of a proton, a higher local magnetic field of the earth (high fluctuation) slightly increases the rotation speed of the protons and thus the gravitation constant.

Any mass distribution other than that presented in this article (particularly a non-spherical or non-cylindrical distribution, or a homogeneously or inhomogeneously filled body or sphere) results in higher moments than a monopole moment for the generated force field. For example, mass distributions have, among other things, a quadrupole moment. The lowest order of gravitational waves is quadrupole radiation, which corresponds to the propagation of quadrupole radiation.

In summary, a specific mass distribution arises in a well-isolated mass formation with freely mobile substructures, which very fast rotates as a whole. The potential difference between the outside and inside of the individual rotating masses (points) generates gravitational energy and a radially symmetric monopolar gravitational field that attracts mass, with field lines perpendicular to the centripetal force. This mass distribution corresponds to a density gradient within the mass formation, while the field strength is proportional to this density gradient. Such force fields arise both in the macrocosm (for the Milky Way, solar system) and in the microcosm (protons). The gravitational constants of individual masses are not exactly identical due to their different mass defects. Depending on its specific distribution, an accelerated mass distribution produces a field (or radiation) with monopolar or higher moments.

This can be proven many times, for example, large masses around the mass defect would be smaller than measured by gravity, the perihelion rotation of the planets and the deflection of light by large masses could be demonstrated in a further work (4), the earth's magnetic field would influence the protons and thus also the gravitational constant, which has already been shown, the gravitational constant would not really be constant, which is also the case (12,13). Dark matter would no longer remain a mystery, since galaxies rotate quickly like protons, have a similar density distribution and build up an additional field that is equal to the gravitational mass. This would attract galaxies with 2G, but only those that would be in the range of gravity = quantized radius. This can be easily confirmed by measurements of the approach of our neighboring galaxy Andromeda

$$E = \frac{1}{2}mv^2 = \frac{mMG'}{d}; \quad G' = \frac{v^2}{2dM} = 2.0204\ G \ \ [7]$$

(v is the mean velocity = 133 km/s, M = $8 \cdot 10^{11}$ solar masses and d= 2.52 million light years). The gravitation would then be instantaneous but would not have an infinite range, the range would be around 10^{23} m. Perhaps an explanation for the dark energy could also be found with this, because the incomplete gravitational effect could be an explanation for the expanding universe with increasing acceleration. Therefore, galaxies rotate faster due to 2G, as observed. Dark matter is therefore not necessary for this to explain this faster rotation. In addition, the Friedmann equations (14) do not apply to the flat universe, since gravity is finite rather than infinite.

$$r = \frac{h}{4\pi m v} = \frac{h}{8\pi 2 m r_p f} = \frac{2\pi h m c}{32\pi m f h} = \frac{c}{16\pi f}; \quad r_p = \frac{4h}{2\pi m c} = 0.841.10^{-15} m \quad [8]$$

Evidence of this is provided by other galaxies further away than this limit, which do not approach the Milky Way like Andromeda does. The farthest dwarf plant, Farout, is located exactly c/16πf from the Sun, where f is the Sun's rotational frequency.

In general, the geometric mean is used when the difference between two quantities of a feature can be better described using quotients than differences. Such a mean value can also be found for protons. A proton in the sun has a rotation speed of 1.09*10^-11 m/s, but in relation to the rotation of the sun it has a relative speed of 2025.569 m/s. The mean is the square root of the product of both speeds. Likewise, its mean radius is 0.841 fm, in its motion around the sun again 341870 km. If you form the product of the proton mass, the geometric mean of the rotational speed and the geometric mean of the radius times the inertia factor 2/5, you get exactly h/4π. This not only proves the rotational speed of a proton, but also explains why the sun rotates at this speed. Also, n = M/m ~ $R^{5/4}$ is the geometric mean of R^3, the mass distribution in the galactic disk and the radius of a hydrogen atom. The relation described above also explains why the velocity vg in the outer regions of a galaxy remains approximately constant with increasing radius.

$$v_g R = \frac{Nh^2}{4\pi m^2 v r} = \frac{Nh^2}{4\pi \frac{M^2}{n^2} v r} \sim \frac{R^{5/2}}{M^2}; \quad v_g^2 \sim \frac{R^4}{M^4} = \frac{MG}{R}; \quad \frac{R^5}{M^5} \sim G \rightarrow v_g \sim G^{2/5} = const. \quad [9]$$

Conclusion:

Why masses cause a curvature of space is an unanswered question for a century, which, since other possible explanations are largely lacking, can assign this process to the nucleon's angular momentum as a very probable and explainable cause, which can be proven mathematically many times, as listed above. The difference to the general theory of relativity can only be seen in the mass defect inherent in all bodies, as well as in the finite range of gravitation and the not really constant gravitational constant G, which is caused by magnetic fields such as the earth's magnetic field and the associated increased angular momentum of the nucleons can be changed.

Hence, both the gravitation and the additional force fields in the macrocosm have a mass-immanent cause, namely a rapid rotation of masses, with the proton it is the rotational wave that causes the angular momentum, with galaxies the rotation of the stars. Dark matter is therefore not necessary as a pre-requisite to explain the faster rotation of galaxies in their periphery. Evidence for this gravitational theory is the moon's mass,

$$m_M = \left(\frac{2\pi}{T}\right)^2 \cdot \frac{r_{EM}^3}{G} - \frac{m_E}{1.0106} = \frac{7.34 \cdot 10^{22} kg}{1.0106} \qquad [9]$$

which can only be determined correctly by subtracting the mass defect from Keppler's 3rd law, because to calculate the gravitational force, the total mass of the nucleons must be used and not the mass of the body which is smaller by the mass defect.

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